DID NAPOLEON BONAPARTE SUFFER FROM HYPOPITUITARISM

(DYSTROPHIA ADIPOSO-GENITALIS) AT THE CLOSE OF HIS LIFE?

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(DYSTROPHIA ADIPOSO-GENITALIS) AT THE CLOSE OF HIS LIFE?[1]

Dr. Arnold Chaplin[2] and Professor Arthur Keith[3] have recently thrown new light on the mysterious nature of Napoleon's last illness and the cause of his death. Dr. Chaplin's careful study of all the available documents has led him to confirm the official report that the actual cause of Napoleon's death was cancer of the stomach undiagnosed during life. He meets the difficulty of reconciling this condition with the long duration of Napoleon's illness—four and a half years—and with the nature of the early symptoms, by assuming that the illness commenced with ulceration of the stomach which ultimately became cancerous. He remarks that "the hepatitis theory which loomed so largely in the St. Helena records finds no support in any of the three descriptions of the appearance post mortem, and must be dismissed from the domains of practical considerations" (pp. 67, 68).

Professor Keith, on the other hand, maintains that the diagnosis of hepatitis upheld by all Napoleon's attendants, who were not biassed by political influences, was correct, and that the hepatitis and perihepatitis found after death were secondary to some form of Mediterranean fever or "undulant fever" endemic in the island of St. Helena. In support of his contention he cites the reports by Sir Frederic Eve and Mr. Shattock on the microscopic appearances of the specimens of intestines reputed to be those of Napoleon, which are now in the College Museum. The plaque-like growths in these specimens are not, he declares, "secondary growths of cancer" as they were originally held to be, but "inflamed hyperplastic enlarged patches of the lymphoid tissue which abounds in the lower part of the small intestine, and which is so often affected in general infection of the body."

[1] A paper read before the Historical Section of the Seventeenth International Congress of Medicine on August 8th, 1913.

[2] The Illness and Death of Napoleon Bonaparte, by Arnold Chaplin, M.D. London: Hirschfield Brothers, Limited. 1913.

[3] History and Nature of the Napoleonic Specimens in the Museum of the Royal College of Surgeons, England, by Professor Arthur Keith, THE LANCET, Jan. 18th, 1913, p. 187.

I do not propose to criticise or discuss these views. There can be no doubt that Napoleon suffered from cancer of the stomach, and it is highly probable that he also suffered from hepatitis and perihepatitis following some sort of fever known to be endemic at St. Helena at the time. Professor Keith's conclusions are strongly supported by the morbid condition of the intestinal specimens which he asserts to be undoubtedly those of Napoleon. My purpose is to draw attention to another aspect of Napoleon's case which as far as I know has not hitherto been presented—namely, that towards the close of his life he suffered from *hypopituitarism*, and that at a much earlier period he showed indications of some form of *dyspituitarism*.

The signs by which hypopituitarism may be recognised are: (1) extreme and progressive obesity; (2) disappearance of hair on the body; (3) atrophy of the genitalia; (4) feminine appearance of the body, and of the pelvic region in particular; and (5) fineness in texture of the skin, and delicacy of the extremities. If we compare these physical signs with Henry's description of the appearance of Napoleon's body after death, they will be found to correspond in all particulars, and we may recognise Henry's description at once as that of a man suffering from hypopituitarism, or "dystrophia adiposo-genitalis."

Henry's account of the post-mortem examination has now been printed in full by Dr. Chaplin from the "Lowe Papers," where it is in the form of a letter to Sir Hudson Lowe and is dated Cavan, 1823. It contains the following observations, which seem to support the present writer's contention.

1. *Obesity.*—"The whole surface of the body was deeply covered with fat. Over the sternum, where generally the bone is very superficial, the fat was upwards of an inch deep, and an inch and a half or two inches on the abdomen."

2. *Alopecia.*—"There was scarcely any hair on the body, and that of the head was thin, fine, and silky."

3. *Atrophy of genitalia.*—"The penis and testicles were very small, and the whole genital system seemed to exhibit a physical cause for the absence of sexual desire and chastity which had been stated to have characterised the deceased."

It will be observed that Henry's comment is hardly in accordance with what is known of Napoleon's private life when in his prime, but it is in keeping with the opinion that in his latter days he probably became impotent in consequence of hypopituitarism.

4. *Feminine characteristics of the body.*—"The skin was noticed to be very white and delicate, as were the hands and arms. Indeed, the whole body was slender and effeminate. ..... The pubis much resembled the 'mons veneris' in women. The muscles of the chest were small, the shoulders were narrow, and the hips wide."

These physical signs seem amply sufficient to justify the diagnosis of hypopituitarism, and we may next inquire

whether any of Napoleon's symptoms were in accordance with this diagnosis, and if so, what was their duration. The main symptoms of hypopituitarism occurring in an adult are difficult to identify, as the condition is often associated with the indirect result of pressure by a tumour on the surrounding brain. But they seem to be in chief: (1) Psychical or mental in the shape of changes in temperament, apathy, indolence, irritability, loss of memory, and sometimes of self-respect or even of decency; (2) readily induced fatigue and prostration; (3) headache, vertigo, vomiting, and constipation; (4) fainting fits or actual epileptic seizures, followed by slow pulse, somnolence or stupor; (5) lowering of bodily temperature, sensations of chilliness, and sometimes œdema of the extremities.

Napoleon's Mental Faculties at St. Helena.

It is agreed even by his most ardent admirers that Napoleon's mental balance was shaken after the campaigns of Austerlitz, Jena, and Friedland; that the cool and calculating faculties on which his success in earlier life depended, deserted him, and were replaced by rashness, grandiose ideas, and unlimited ambition. He himself admitted at St. Helena that the failure to make peace during the Congress at Châtillon in June, 1814, was "une lourde sottise."[4]

But it is generally maintained that, although his powers of judgment may have forsaken him, his intellect and mental faculties were unabated. Any statement to the contrary may perhaps meet with indignant protest, for glamour always surrounds the "man who was," and the sympathy and compassion which all must extend to a fallen star may lead us to exaggerate its brilliance and to ignore the evidence of its extinction. Dispassionate students of Napoleon's life in exile must fail, however, to be impressed by the examples of his literary productions which have been cited in proof that his genius remained unimpaired. In truth, his elaborate and detailed study of incidents in the "Siege of Troy" seems but a juvenile achievement. It was no mere *jeu d'esprit* but a solemn and ponderous attempt to demolish and disprove stories of a purely legendary order. A vestige of the sense of humour and of proportion should have told him that he might as well have occupied himself in discussing the strategy employed in "The Battle of the Frogs and Mice." Again, one has been called upon to admire his "Essay on Suicide" as the fruit of a mature philosophy; yet candour compels one to admit that it contains no spark of genius nor even originality. The best that can be said for it is that for naïve and complacent correctness of thought and style it might win a prize in some provincial academy.

[4] J. Holland Rose: The Personality of Napoleon, Lowell Lectures.

We cannot forget, moreover, that certain grand and dignified utterances attributed to Napoleon at St. Helena were edited and embellished by Las Cases, the journalist, no doubt, as he wrote in his diary, "in order to excite a lively interest in a large portion of the population of Europe."

It is pitiful to trace the mental decadence of this intellectual giant in the sordid details of his closing years. His puerile sulks and fits of temper, his vain insistence on a barren title, his ungracious reception of Lowe's attempts to alleviate his lot, his condescension to act the part of potentate in a court of obsequious Montholons, Bertrand and his silly wife, and Gourgaud the dullard, are significant enough. Perhaps the saddest indication of his mental decay is that Napoleon became a bore, as may be gathered from the description of his reading aloud to his companions night after night the tragedy of "Zaire," and sternly rebuking poor Madame de Montholon when she fell asleep. Napoleon, in fact, degenerated during the last five years of his life into a peevish, querulous, and prematurely aged man. It is difficult to attribute his deterioration to circumstances, to the climate of St. Helena, or to hepatitis, ulcer or cancer of the stomach, or to "a form of undulant fever." None of these conditions is associated with mental enfeeblement, nor with the loss of self-respect implied in Arnott's statement that "he found the room and the bed-linen in a dirty state, for Napoleon had been allowed to expectorate anywhere at will."[5] Some other explanation of his mental and physical decay is needed, and the theory that he suffered from gradual hypophyseal insufficiency seems to meet the case, and is in accordance with the appearance of the body after death.

Decline of Physical Energy.

A day of Napoleon's life at Elba is thus described by Sir Neil Campbell :—

> After being yesterday on foot in the heat of the sun from 5 A.M. to 3 P.M. visiting the frigates and transports, he rode on horseback for three hours, as he told me afterwards, "pour se défatiguer."

But Napoleon's restless and untiring energy at Elba were soon replaced by sloth and lassitude at St. Helena. At first we hear of his walking, driving, and exploring the island on horseback, but by degrees, during the first two years of exile, he abandoned horse-riding, and, indeed, every form of exercise. The accepted explanation is that he did so out of pique at the restrictions imposed upon him in consequence of his well-known escapade in evading his attendants and galloping out of bounds. It seems more probable, however, that he ceased to take exercise because he no longer

[5] Lowe Papers, vol. xx., 157, f. 3.

felt the need "pour se défatiguer." Fatigue and prostration readily induced by exertion were, in fact, signs of the insidious onset of hypopituitarism. From July, 1818, to September, 1820, Dr. Chaplin says that Napoleon was not seen by any medical man, only vague rumours of his failing health were heard. But Montholon states that Napoleon spent the greater part of the day indolently, with frequent recourse to hot baths in which he remained for hours at a time. Now the climate of St. Helena is not cold, and this curious habit of Napoleon may have proceeded from the sense of general chilliness to which the subjects of hypopituitarism are liable. In the later stages of his illness several references are made to the icy coldness of the extremities.[6]

Obesity.—Napoleon was always inclined to stoutness, and comments were made on his increasing corpulence by most of his attendants. It was not unnaturally ascribed to laziness and want of exercise by those who maintained that he was only suffering from hypochondriasis, and it was certainly difficult to reconcile absence of wasting with the existence of any serious form of hepatitis.

Napoleon's last illness undoubtedly puzzled all who attended him, and it is unfair to charge them either with culpable ignorance or, worse still, with gross professional dishonesty. The *dénoûment* came as a surprise to all, because the symptoms of ulcer, cancer of the stomach, hepatitis, and "undulant fever" were atypical. They were masked by "dystrophia adiposo-genitalis," a condition which could not be recognised at the time, as the functions of the hypophysis cerebri and of other ductless glands remained unknown.

Napoleon endeavoured to combat his increasing lassitude with some success, for between October, 1819, and July, 1820, he was out of doors engaged in gardening nearly every day, and in May, 1820, he resumed exercise on horseback. But after and during September, 1820, fatigue after the slightest exertion became pronounced, and frequent fits of lethargy were noticed. On Oct. 4th he took his last ride in public, but was so tired that he had to come home in his carriage.

Carriage exercise and short walks were all that could be attempted, and even these taxed his strength severely. Dr. Chaplin considers that up to October, 1820, indifferent health would have been a correct description of the condition of Napoleon; but that at that time a sudden declension took place, and thenceforth to the end he was dangerously ill. "Something had happened which rapidly sapped the strength and produced symptoms of gastric disorder far more acute

[6] Œdema of the feet was noticed for the first time in October, 1816, and again in September, 1817. (Chaplin, p. 13, op. cit.)

than those which had been endured for three years." He attributes the exacerbation of pain, vomiting, weakness, and prostration to the development of a rapidly growing cancer in the lips of a chronic ulcer of the stomach. It is easy to construe the symptoms in the light of the post-mortem examination, but it must have been difficult to do so during life. It is inconceivable that Arnott, eight days before Napoleon became moribund, could have assured the British authorities that there was no danger and that the disease was merely hypochondriasis, had not the symptoms been obscured by the mental and physical deterioration which, as is now contended, were the result of hypopituitarism.

The Nature of Napoleon's Cerebral Seizures and the Cause of his Bradycardia and Frequency of Micturition.

There were certain conditions of medical interest connected with Napoleon's health which Dr. Chaplin thinks have been thrust into undue prominence by historians. In the present writer's opinion, however, they are of considerable importance as evidence that during the greater part of his life Napoleon was subject to some form of dyspituitarism which ended, as already maintained, in hypopituitarism. These conditions were (1) an habitually slow pulse which, according to Corvisart and others, rarely beat above 50 per minute; (2) a liability to "occasional attacks of vomiting followed by a state of lethargy, and stupor almost amounting to unconsciousness"; (3) habitual frequency of micturition ending in dysuria.

Napoleon's cerebral attacks occurred generally after prolonged physical exertion and mental strain, and outbursts of temper preceded them on more than one occasion. A particularly bad one is mentioned after the fatigue and disappointment consequent on the battle of Aspern.[7] If we may believe the statements of women whose society he frequented, such attacks were wont to follow sexual intercourse. At St. Helena the attacks seem to have changed in character, for we learn that on Jan. 17th, 1819, Napoleon had a serious attack of vertigo followed by fainting, which appeared so grave that measures were taken to summon medical aid at once. The vertigo and faintness, which occurred more than once, were succeeded by headache. Stokoe, who was called in, apprehended apoplexy, but was evidently mystified, for, as Baxter subsequently pointed out, he recommended "a more nourishing diet instead of bloodletting." "A nourishing diet," Baxter said, "generally means animal food and wine. Such articles ordered for a patient who is considered to be in danger of a determination of blood to the head would convey suspicion either of the

[7] Allison: History of Europe, vol. xvii., p. 40.

sincerity or professional talents of Mr. Stokoe." No doubt Stokoe was at a loss to explain the symptoms, and was guided rather by the evident prostration and weakness of Napoleon than by the rules of practice in cases of "threatened apoplexy."

I do not know any references to similar attacks of headache, fainting, and vertigo, but mention is frequently made of fits of lethargy, somnolence, and vomiting during Napoleon's last illness. It is impossible to say whether the vomiting was due to local gastric disease, or was of cerebral origin as seems to have been the case in earlier life. The habitual slowness of pulse seems to have been replaced by undue frequency at St. Helena, and complaint was made of palpitation and cardiac irregularity.

Dr. Chaplin rejects with some warmth the statement often made that Napoleon was epileptic. "Gusts of passion and severe vomiting followed by lethargy," he says, "are poor facts on which to brand a man with the stigma of epilepsy." It is true that there is no evidence that Napoleon ever suffered from a genuine fit of epilepsy, yet it must be admitted that the attacks of vomiting followed by "stupor verging on unconsciousness" set up by passion, excitement, and fatigue were certainly of cerebral or epileptiform nature.

Cushing has recently drawn attention to the frequency of epileptiform tendencies in the subjects of pituitary disease. Thirteen out of 18 cases showed these tendencies. Some had definite epilepsy associated with loss of smell, or olfactory or gustatory auræ. In other cases the attacks were those of unconsciousness unattended by convulsions and followed by stupor. Sometimes there were attacks of semi-unconsciousness with slow pulse and low blood pressure, or dizzy spells, headache, mental confusion, and loss of memory lasting 20 minutes. He also alludes to types of epilepsy often accompanied by an extreme lowering of temperature and slowing of pulse occurring in obese subjects with ravenous appetites. Such epileptics, he says, are relieved by pituitary extract, and their attacks resemble those of patients suffering from demonstrable hypopituitarism. Cushing considers that the number of his cases showing epileptic tendencies—13 out of 18—is so large that the association cannot be regarded as merely coincidental. He suggests that a possible predisposition to cortical instability exists as a consequence of hypophyseal insufficiency.

Dr. Chaplin mentions that "in recent days the exponents of the new cardiac pathology have regarded the slow pulse and the attacks of stupor verging on unconsciousness as indications that Napoleon suffered from partial or complete "heart block." But complete or partial heart block is a grave condition; there is no evidence that his attacks—with the exception of the one at St. Helena—gave rise to any alarm, nor that he was in any way the worse for them. It

seems, on the whole, more probable that Napoleon's bradycardia and liability to curious cerebral symptoms were caused by some abnormality of his hypophyseal secretion.

Hypersecretion or hyposecretion?—It is not easy to decide how far Napoleon's dyspituitarism was in the direction of excess or defect of pituitary secretion. The well-known physiological action of pituitary extract is to slow the pulse, raise blood pressure in general, and that of the cerebral circulation in particular. It may therefore be that Napoleon's habitual bradycardia was due to hypersecretion, and that his attacks of vomiting, followed by signs of cerebral exhaustion caused by fatigue or excitement, were the result of temporary cerebral anæmia, which in turn depended on some vascular cerebral disturbance. Pituitary extract is also a powerful diuretic, and this suggests a possible explanation of the *urinary* trouble from which Napoleon told Antommarchi he had suffered all his life.

Now, Ségur says that after the battle of Borodino Napoleon had an aggravation of his habitual complaint "dysuria," and that the condition became so bad that riding caused considerable pain.[8] But Napoleon also told Antommarchi that irritability of the bladder would not permit him to sleep for more than a few hours at a time, and that he had *always experienced this trouble.* Since Antommarchi found at the post-mortem examination small calculi in the bladder and the coats of that organ diseased, there can be no doubt that cystitis was the cause of the painful strangury and frequent desire to micturate in later life. But it is impossible that this condition of cystitis should have existed throughout Napoleon's existence. It is far more probable that it came as an aggravation of a constitutional peculiarity—namely, polyuria and frequency of micturition due to hyperpituitarism—and that Napoleon and his medical advisers confused this peculiarity with the symptoms of cystitis which ultimately occurred.

Napoleon's Sexual Life.

Henry, seemingly a follower of Gall and Spurzheim, notes the "strong development of the organ of philoprogenitiveness" in Napoleon's cranium. He then with curious inconsistency remarks on the appearance of "the whole genitive system which seemed to exhibit a physical cause for the absence of sexual desire and the chastity which had been stated to have characterised the deceased."

In spite of inconsistency, his observations are not devoid of interest. Napoleon, whether "philoprogenitive" or not, seems to have been liable to sudden and vehement sexual impulses. If anecdotes are to be believed, these impulses beset

[8] Ségur: La Campagne de Russie, ed. Nelson, p. 124.

him on occasions which were sometimes inconvenient, and a peculiarity about them was that they subsided with equal suddenness if not immediately gratified, or if meanwhile something occurred to disengage his attention. All women were to him but *filles de joie*. Sexual rather than social attractions in women appealed to him, and he was incapable of lasting affection for any woman, or of regarding her as an intellectual equal and helpmate. The best women, in his opinion, were those who bore most children. Sexual gratification was the only kind of love he knew, and his remarks on the subject when at St. Helena must be taken as those of a man whose desire had failed, not as the mature reflections of a philosopher. It is true that scandals were afoot in regard to his sexual life while in exile, but these seem to have been unfounded, and there is no reason either for doubting the chastity—during this period at least—to which Henry referred, or the physical cause to which he attributed it.

It is possible that Napoleon's abnormal "libido sexualis" was due to hyperpituitarism. For gigantism in early life is sometimes associated with precocious sexual development, and abnormal sexual activity may be a sign of early acromegaly. Cushing's first case is that of a man whom he describes as a "veritable Gargantua" at the age of 35. At 19 he measured 6 feet 4 inches, and was of unusual strength. "He was intelligent, a good student, and aside from an uncontrolled 'libido sexualis' had good habits." At 25 there were no signs of acromegaly, but they appeared at the age of 27. At 35 his height was 6 ft. 6 in., he was typically acromegalic, and had lost "libido et potentia sexualis."

The association of atrophy of the genital organs with lesions of the pituitary has led some authorities (Tandler, Gross, and others) to attribute the primary cause of the pituitary affection to the atrophy of the genital glands. But although changes are produced in the pituitary by castration, the physical results of castration do not resemble dystrophia adiposo-genitalis, and it is much more likely, as Blair Bell maintains, that this condition is subsequent to a pituitary lesion.

The Part or Parts of the Hypophysis Cerebri which were probably concerned in the Causation of Napoleon's Dyspituitarism.

As the head was not opened after death the condition of the hypophysis cerebri must remain for ever unknown. But modern investigations of the functions of the different portions of the pituitary gland suggest conclusions as to those portions which were probably affected in the case of Napoleon. Although authorities are by no means agreed in

the matter, it seems to be fairly well established that the *pars anterior*, or glandular portion, is chiefly concerned in regulating skeletal growth, sexual activity, and temperature. Whereas the *posterior part*, or pars nervosa, which includes the pars intermedia, is more closely allied to metabolic processes and especially to the metabolism of sugar, "and also probably serves to promote contractility and tone of plain muscular tissues generally, as well as of the heart, and to excite the activity of certain glands—viz., the kidney and mammary gland." (Schaefer.)

Gigantism in early life and acromegaly in later life are regarded as indications of hyperpituitarism on the part of the anterior lobe. Keith supposes that in such cases the organ supplies "hormones" which render osteoblasts more sensitive to mechanical and other stimuli. Hitherto it has not been found possible to produce hyperpituitarism in the shape of gigantism or acromegaly experimentally. Clinical evidence in favour of the view that acromegaly is due to hyperpituitarism is that in some cases during pregnancy, when the gland is known to become enlarged, transient signs of acromegaly have been observed. But the theory is mainly an inference drawn from the fact that experimental hypopituitarism (partial extirpation of the anterior lobe) causes "acromegaly reversed," i.e., shortening of the skull, and diminution in the size of the limbs (Crowe, Cushing, and Homans). The other effects of experimental hypopituitarism are atrophy or ill-development of the genitalia, loss of sexual hair, feminine characteristics of the pelvis and skin in males, obesity, and lowered temperature.

The influence of the anterior lobe on temperature is shown by the *thermic reaction* which is produced by injection of anterior lobe extract in cases of definite hypopituitarism. In normal individuals, however, no such thermic reaction takes place. Cushing explains the paradox that gigantism and acromegaly are often, if not usually, associated with dystrophia adiposo-genitalis, by supposing that the exit of the secretion of the posterior lobe into the third ventricle through the infundibulum is blocked by a tumour. He finds that adiposity may attend tumours of either anterior or posterior lobe. Hypopituitarism of the posterior lobe is also indicated by diminished metabolism, diminished consumption of oxygen and lessened output of CO_2, and a high degree of tolerance of sugar, which is turned into fat and stored in that form in the tissues, thus accounting for the obesity.

The functions of the *pars intermedia* are far from being decided. They are probably not the same throughout life. In childhood the cleft between the anterior and posterior lobes is wider than in later life. Erdheim and Thom have described changes which occur in the hypophysis at about the age of 40, "when the basophil cells of the pars anterior are seen to bridge over, generally at three or four points simul-

taneously, the cleft between the anterior lobe and the 'pars intermedia,' and thence to invade the 'pars posterior.' It is about this time, too, that small adenomata are frequently met with, while before that time they are rare."[9] In the child, moreover, the cells of the anterior part contain less glycogen, and those of the posterior part less pigment than in the adult. During pregnancy, again, certain changes take place in the cells of the gland. "The eosinophilia disappears and a large portion of the cells of the pars anterior becomes chromophobe and ..... have been called 'pregnancy cells.'"[10]

The histological and structural changes, therefore, which have been observed in the hypophysis at different life stages may perhaps be taken to imply that in early life the anterior and posterior lobes have independent functions, whereas in later life the organ—as Blair Bell maintains—acts as a whole. The "bridging over" of the pars intermedia by basophil cells passing from the pars anterior towards mid-life is in favour of Blair Bell's contention. It is impossible, however, at the present time to decide the question one way or another. Cushing's supposition, that the paradoxical association of gigantism and acromegaly with dystrophia adiposo-genitalis is due to blockage of the infundibulum, may be correct in some cases. But his simpler explanation is that hyperpituitarism in time gives way to hypopituitarism, the osseous and tissue changes of the former remaining permanent whilst the changes of the latter are superadded.

Swale Vincent considers that the thyroid, parathyroids, and pars intermedia of the hypophysis may form one apparatus. But there seems to be a far wider correlation between the hypophysis and other ductless glands, which renders the whole question of their individual functions and influence over each other, one of the greatest difficulty. Cushing found that extirpation of the whole of the pituitary gland or the whole of its anterior portion caused death in a short time. Biedl has stated that the posterior lobe (pars intermedia and pars nervosa) may be removed without producing symptoms.[11]

Returning to the case of Napoleon, it is hardly necessary to state that he suffered neither from gigantism nor acromegaly. "The features," Henry said, "were regular and might be considered beautiful," and this is borne out by the cast of the face taken after death. He described the head as being of large size, "which must have been disproportionate to the body even in youth. The forehead was very broad and full." But Antommarchi's measurements show that the maximum circumference of the head—20 pouces 10 lignes (old

[9] Gerhardt von Bonin: Study of a Case of Dyspituitarism, Quarterly Journal of Medicine, January, 1913.

[10] Blair Bell: Arris and Gale Lectures, THE LANCET, April 5th, 1913, p. 940.

[11] Blair Bell: Op. cit.

French) or 22·5 inches—was not above the average. The apparent disproportion was probably due to the large size of the face and the powerful lower jaw which characterised Napoleon. But the mandibular prognathism of acromegaly was absent, and the only signs of acromegaly which may be detected in Henry's description were the width of the hips and general feminine appearance of the pelvic regions, which are in keeping with the pelvic characters observed in male acromegalic subjects by von Bonin, Lannois, Roy, and shown, as von Bonin states, in illustrations of cases recorded by Buday, Thomson, and others. Cushing has drawn attention to the "maxillary prognathism" noticeable in subjects of hypopituitarism, and contrasts it with the "mandibular prognathism" of acromegaly. Cushing's photographs illustrating "maxillary prognathism" have a marked likeness to each other, and some may detect a resemblance between these subjects of hypopituitarism and the portraits of Napoleon in his later years.

As regards the nature of the lesion in Napoleon's case, it is hardly likely to have been a tumour, because there is no evidence that the optic commissure was involved or that vision was in any way affected. But the presence of a tumour is not essential for the production of gigantism, acromegaly, and dystrophia adiposo-genitalis. All these conditions may occur singly or combined, as the result of excess, defect, or alteration of the functions of the component parts of the pituitary body.

In conclusion, we have evidence that Napoleon towards the close of his life suffered from hypopituitarism of the anterior lobe in the shape of genital atrophy, sexual alopecia, skeletal and tissue changes of feminine type, and lowered temperature. Hypopituitarism of the posterior lobe was, perhaps, indicated by obesity and lowered metabolism. How far his gradual failure of mental and physical energy was attributable to hypopituitarism on the part of the anterior or posterior lobes or of the organ as a whole must be left undetermined.

In regard to evidence of hyperpituitarism in Napoleon up to the zenith of his career one is on less sure ground. One can only adduce the habitual slowness of pulse, the life-long frequency of micturition, the "libido sexualis," and the anomalous cerebral attacks to which he was liable, as evidence of some form of dyspituitarism.

Time is not yet ripe for drawing any sweeping conclusions as to the importance of our ductless glands, but knowledge grows apace, and physiologists may in future come to regard not only our physical and sexual development, but also our mental, moral, and intellectual faculties as measures of the activity of our glandular secretions.

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